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SOUTHERN PAIUTE AND NAHUATL—A STUDY IN UTO-AZTEKAN. PART II¹

BY EDWARD SAPIR

SUPPLEMENTARY Note on *Uto-Aztekian o*.—In pp. 399 and 400 of Part I of this paper examples were given of Nahuatl and Sonoran *o* corresponding to Southern Paiute open *ɔ* (Ute *ö*) as distinct from Southern Paiute close *o*, *u* (Ute *o*, *u*), which also corresponds to Nahuatl *o*. We suspected that Nahuatl *o*: Shoshonean *o* represented a Uto-Aztekian vowel distinct from Nahuatl *o*: Shoshonean *ɔ*, and found confirmatory evidence for this in Cora. Before definitely positing a Uto-Aztekian *ɔ*, however, I stated that “more evidence, based on more carefully recorded material (as regards vocalic qualities) than is generally available for comparison, is highly desirable.”² Since these words were penned the required evidence has appeared in the shape of Juan Dolores’ “Papago Verb Stems.”³ It is clear from Dolores’ material that whereas S. P. close *o* (*u*) corresponds to Papago *u*, the Papago *o* (doubtless an open vowel) is the regular representative of S. P. *ɔ* (Ute *ö*). The S. P.-Papago⁴ examples noted of this latter correspondence are:

Pap. *on*⁵ “salt”: S. P. *ɔa-* “salt”

Pap. *koi* “to sleep (sing.), die (pl.)”: S. P. *qɔ'ɔi-* “to go to sleep (pl.)”

¹ Part I of this article appears in the *Journal de la Société des Américanistes de Paris*, N. S., x, 1913, pp. 379–425. It was the intention of the author and of the Société des Américanistes to publish Part II in the same journal, but owing to the war and the consequent unsettled condition of scientific work and publication in Europe, it has been impossible for Dr Sapiр to obtain a response to his inquiries regarding the proposed publication in Paris, or whether, indeed, the manuscript of Part II of his article had been received. Therefore, to avoid further delay the remainder of his contribution will appear in this and following numbers of the *American Anthropologist*.—EDITOR.

² *Journal de la Société des Américanistes*, op. cit., p. 401.

³ *University of California Publications in American Archaeology and Ethnology*, vol. 10, 1913, pp. 241–263. All Papago forms cited in this paper are taken from Dolores’ work.

⁴ Abbreviated Pap.

⁵ Dolores’ small capitals represent voiceless or aspirated sounds.

Pap. *noh* "to bend": S. P. *nɔgɔ-* "to bend"

Pap. *o'ohṛ* "sand": S. P. *at'a-* "sand" (< **ət'a-*, cf. *taŋa-* "knee": < **taŋa-*)

Pap. *tohṇü* "knee": S. P. *taŋa-* "knee" (< **taŋa-*); Tüb. *toŋo-*

Pap. *ovi'ṛši* "awl" (originally "little piece of wood" ?): S. P. *ovi-* "stick"

Pap. *oh* "back": S. P. *ɔ̄-* "back"; Ute *öä-*

Examples of corresponding long *ɔ̄* are:

Pap. *wōhpṛü* "to run (pl.)" (*wō-* < **pō-*): S. P. *pōya-* "to run about"

Pap. *wō'kṛü* "trail," *wō'kah* "to have a trail": S. P. *pō-* "trail"

With these examples contrast such as:

Pap. *tšuh* "to stop burning of itself": S. P. *tuγwi-* "fire goes out." Uto-Aztekian
**toki-*

Pap. *wuɪ* "eye": S. P. *pu'i-* "eye"

Pap. *uɪ* "to have wind on the bowels": S. P. *ō-* "to break wind"

Pap. *u'uh* "war arrows": S. P. *ō'* "arrow"; Hopi *hō-hū*; Luis. *hu-la*; A. C. *hu-l-*

The combined evidence of Southern Paiute (and Ute), Papago, and Cora thus makes it certain now that open *ɔ* was a Uto-Aztekian vowel distinct from close *o* (*u*). Both seem to have fallen together into *o* (*u*) in Nahuatl. Shoshonean or Sonoran testimony will in many, if not most, cases, however, indicate which was the original Uto-Aztekian vowel. Thus, Nahuatl *tona* "faire chaud" (*tonatiuh* "sun") and *chocoa* "to cry" are proved to have originally had *ɔ*, not close *o*, in their first syllable by comparison with Papago *ton* "to shine" and *šohšah* "to cry" respectively (*šoh-* < **tšɔk-*, as will be demonstrated farther on).

(b) CONSONANTS

The consonantal system of Southern Paiute is even more extensive relatively to that of Nahuatl than its vocalic system. As in the case of the Southern Paiute vowels, however, many of its consonants are only secondary forms of other, primary, consonants and, when thus recognized, must be referred to these latter when etymological comparisons with Nahuatl are instituted. Thus, the total number of Southern Paiute consonants that have to be directly accounted for in terms of Nahuatl consonants is considerably less than might at first blush appear. Before proceeding to a specific treatment of the Uto-Aztekian prototypes of the Southern Paiute and Nahuatl consonants, we must briefly review the consonantic systems of these languages.

Nahuatl Consonants.—The total number of distinct consonants in Nahuatl is not large. They are represented in the following table:

	VOICE- LESS STOP	VOICE- LESS AF- FRICATIVE	VOICE- LESS SPIRANT	VOICED SPIRANT	NASAL	VOICED LATERAL	VOICE- LESS LAT- ERAL AF- FRICATIVE
<i>Bilabial</i>	p			W	w	m	
<i>Dental (alveolar)</i>	t	ts	s		n	l	L
<i>Prepalatal</i>		tš	š	y			
<i>Palatal</i>	k				η		
<i>Labialized Palatal</i>	kw						

Of these, *k* is regularly represented, in the Spanish orthography which has become the standard for Nahuatl, by *c* (before *a, o, u*, and consonants) or *qu* (before *e, i*); *kw* by *qu* (before *a*) or *cu* (before *e, i*); *ts* by *tz*; *tš* (*ch* of English *church*) by *ch*; *s* by *ç* (before *a, o, u*), *c* (before *e, i*), or *z* (before consonants); *š* (*sh* of English *ship*, at least approximately) by *x*; *w* by *u* or *hu*; *W* (approximately *wh* of English *when*, but, it would seem, regularly with *i-timbre*) by *-uh*; *η* by *n* (only before *qu, cu=kw*, and *qu, c=k*); and *L* by *tl*. Phonetic *p, t, m, n*, and *l* are so represented in Nahuatl orthography. *ll* is simply long or geminated *l*, resulting from assimilated *-lL-* (*-llt-*), and need not detain us further.

Not all the sixteen consonants of the table are primary. *W (uh)* results, as we have already seen,¹ from original *w* followed by syncopated *a, e*, or *i*; *η* from original *n* or *m* before *k*- sounds (*k, kw*). *š (x)* is in part apparently a primary consonant (e. g., *xalli* "sand," *xochitl* "flower"); in large part, however, it is a resultant of original *y* followed by syncopated *a, e*, or *o*,² of syncopated *i*,¹ or of original *s* followed by syncopated *i*.³ *tš (ch)* is in large part a primary consonant (e. g., *chocoa* "to cry," *chiua* "to make"), in part a resultant of original *t* followed by syncopated *i*.³ It may turn out ultimately that all cases of apparently primary *š* are really resultants of original *s*. There are thus only fourteen, or even thirteen, Nahuatl consonants that need to be directly treated from a comparative standpoint.

¹ Part I of this paper, pp. 417, 418.

² *Ibid.*, p. 417.

³ *Ibid.*, p. 418.

The so-called "saltillo" (indicated by $\acute{}$ over vowels) should also be reckoned as one of the Nahuatl consonants, as shown by its phonetic treatment (e. g., *pìlli* "older sister," with *-tli* as in *tlantli* "tooth," not with *-tl* as in *tepetyl* "mountain"). Carochi's account of it seems to indicate clearly that the saltillo is a glottal stop: "The (`) indicates the pronunciation which they are accustomed to call saltillo (little jump), for the vowel on which this accent falls is pronounced as though with a jump or hiccup or difficulty and with a halt. . . ."¹ However,² the saltillo does not seem to be pronounced alike in all Nahuatl dialects, those of Oaxaca (Tuxtepec, Pochutla) making use of a voiceless mid-palatal spirant (*x*) instead of the glottal stop (e. g., *ox-* "road," instead of *o'-*, generally written *ð-*). The salto (indicated by $\hat{}$ over vowels) occurs only at the end of a word and regularly turns into the saltillo when the suffixing of another element removes it to the interior of the word. It seems to differ hardly more than orthographically from the saltillo; perhaps, as its name ("jump") indicates, it sounded more forcible to Spanish ears than the saltillo because it abruptly ended the word. The etymological value of the saltillo will be discussed farther on.

Southern Paiute Consonants.—Every Southern Paiute consonant, except *s* and *š*, which are always completely unvoiced, appears in two forms—a voiced or, for stops, unvoiced but unaspirated form, and an unvoiced and markedly aspirated form; *y*, however, when unvoiced, unites as *i* with a preceding vowel, the resulting diphthong being followed by aspiration (thus, *pa* is related to *p'a* as *aya* to *ai'a* or *ai'*). The unaspirated (voiced) consonants are used before voiced vowels, the aspirated (unvoiced) consonants before voiceless vowels.³

Initially and after voiceless vowels stopped consonants appear in their simple or primary form, unaspirated or aspirated (according to

¹ "La (`) es señal de la pronunciacion que suelen llamar saltillo, porque la vocal sobre que cae este acento se pronuncia como con salto ó singulto, ó reparo, y suspencion."—Carochi, p. 402.

² As I have been informed by Dr F. Boas.

³ The conditions under which vowels become voiceless in Southern Paiute have been already defined. See I, pp. 385, 386. Analogous sets of voiced (or partly voiced) and voiceless aspirated vowels and consonants occur also in Papago; see Kroeber's remarks in Dolores, *Papago Verb Stems*, p. 242.

the nature, voiced or unvoiced, of the following vowel) in the former case, unaspirated in the latter. These consonants are *p*, *t*, *ts*, *tš*, *q* (about midway in point of articulation between mid-palatal and true velar), and *qw* (labialized *q*, always felt as a simple sound); *kv*, a palatalized form of *q*, regularly occurs after *i*- vowels, *k* before *i*- vowels (these must be considered as purely secondary forms of *q*). In aspirated form these are *p'*, *t'*, *tš'*, *ts'* (generally heard as *ts'*), *q'*, *q'w*, (*k'y*). *ts* and *tš* are doubtless variants of one sound, *tš* occurring before *a*, *o*, *ɔ*, and *i*, *ts* before *i* (compare *q: k*). Medially after voiced vowels this set of primary stopped consonants appears in one of three forms: geminated (or lengthened), spirantized (*tš* and *ts*, however, do not become spirantized), and nasalized; each of these three types may again be unaspirated (in part voiced) or, in final syllables, aspirated (and voiceless, except that aspirated nasalized stops do not lose voice in their nasal element). The geminated stops are *p'*, *t'*, *tš'*, *ts'*, *q'*, *q'w*, (*k'y*); in aspirated form: *p''*, *t''*, *tš''*, *ts''* (this is generally heard as *ts''*, *s''* assimilating to long *s*), *q''*, *q''w* (which may also be interpreted as *q'W*, i. e., *q'* + voiceless *w*), (*k'y*). The spirant developments of the stops are *v* (bilabial, as in Spanish), *r* (moderately trilled with apex of tongue), (*tš*, *ts*), *γ* (voiced guttural spirant, about like *g* of North German *sagen*), *γw*, (*γy*, nearly but not quite *y*); in aspirated form: *φ* (voiceless bilabial spirant), *χ* (voiceless *r*), (*tš''*, *ts''*), *x* (like *ch* of German *Bach*), *xw*, (*xy*, like *ch* of German *ich*). The nasally affected stops are *mp*, *nt*, *ntš*, *nts*, *ηq*, *ηqw*, (*ηk'y*); in aspirated form: *mp'*, *nt'*, *ntš'*, *nts'* (generally heard as *nts''*), *ηq'*, *ηq''w* (which may be interpreted also as *ηq'W*), (*ηk'y*).

We cannot here go into the various rules as to when geminated, spirantized, or nasalized consonants are used, as that would lead us too far into the details of Southern Paiute phonology and grammar. Certain suffixes regularly appear in only one of the three forms (e. g., geminated *-q'a-*, verbal suffix denoting plurality; spirantized *-va-*, postpositive element "at"; nasalized *-ηqü-*, indirective verbal suffix "for"); still others in either spirantized or nasalized form (e. g., spirantized *-vān'ia-*, nasalized *-mpān'ia-*, verbal suffix denoting futurity; the latter form is used after stems possessing a nasal consonant *m*, *n*, or *η*); still others in all three

forms, there being no obvious rules as to which of these is demanded by a given stem (e. g., *-q'ai-*, *-γai-*, and *-ηqai-*, verbal suffix "to have"; *-ti-*, *-ri-*, and *-nti-*, participial suffix; *-p'i-*, *-vi-*, and *-mpi-*, absolute suffix for body-part nouns). We have thus geminating, spirantizing, and nasalizing stems (stems with nasal consonants tend to belong to the last type, though there are also many nasalizing stems that possess no nasal consonant, e. g., *ovi-* "stick," *ayο-* "tongue"). When two stems are compounded, the second has its initial consonant, if it begins with one, geminated, spirantized, or nasalized, according to the character of the first stem. Thus, from *qanⁱ* "house" are formed *aŋqá-yanⁱ* "red house" (*aŋqa-* "red" spirantizes), *timpí-k^uyanⁱ* "stone house" (*timpí-* "stone" geminates), and *ovi-ηk^uanⁱ* "wooden house" (*ovi-* "wood" nasalizes); in the last two examples *-qanⁱ* is at the same time palatalized to *-k^uanⁱ* because of preceding *i*. Suffixes also, in reference to such following suffixes as may have forms of two or all three classes, belong to one of the three types. Thus, adjectival *-q'a-*, *-γa-*, *-ηqa-* spirantizes, hence *aŋqá-γa-ṛ^z* "being-red, red"; *-q'a-*, *-γa-*, *-ηqa-*, verb suffix "to have" (another form of *-q'ai-*, *-γai-*, *-ηqai-* already listed) nasalizes, hence *timpí-k^ua-ntⁱ* "having a stone."

Analogous to the stopped consonants is *m*. After vowels it is either geminated (or nasalized) to *-m[·]-*, or spirantized to *-ηw-*; aspirated forms are *m[·]* and *η^{'w}*, in which *m* and *η* are voiced, at least in part (initially, however, aspirated *m*, which stands before voiceless vowels, is entirely voiceless, *M*). After vowels *n* regularly appears long, *-n[·]-*; its aspirated forms, used analogously to those of *m*, are *n[·]* and *N*. Besides these two nasals must be listed also *η* (*ng* of English "sing"), palatalized *η^u*, with its aspirated form *η[']*; it cannot occur initially. *w* and *y* have corresponding aspirated forms *'w-* and *'v-* when initial; postvocalic *w* is regularly nasalized to *-ηw-*, aspirated *-η^{'w}* (thus, *-ηw-* or *-η^{'w}* may go back to original *-m-* or *-w-*).

Postvocalic *s* and *š* are regularly long, *s[·]* and *š[·]*. There are no "spirantized" forms of *n*, *s*, and *š*. We shall see reason later on, however, to believe that original postvocalic non-geminated *n* disappeared; similarly, that original postvocalic non-geminated *s*, *š* became ' (glottal stop). In other words, originally *p:v*, *t:r*,

q : γ, m : ηw, n : zero, and s, ɔ :' were equivalent pairs. The latter two, however, are not now felt as equivalent pairs in Southern Paiute.

Glottal stops are rather frequent in Southern Paiute and of considerable grammatical importance. They are found not only medially between vowels but also initially (in which case the first syllable with short vowel counts as two moræ; e. g., *'at-i-* "good," often heard as *'at-i-* with murmured *'-*) and finally. Frequently a glottal stop coalesces with a preceding stopped consonant, a glottalized stop resulting in which the glottal closure and release are synchronous with those of the oral chamber. Thus we have a new series: *p', t', t'ɔ', t's, q', q'w, (k'v)*, each of these again occurring in geminated and nasalized form (e. g., *p'p', mp'*). As glottalized stops, however, are of purely secondary origin in Southern Paiute, they need not, as such, concern us further in this study. The Southern Paiute glottal stop does not (except possibly in S. P. *ni'* "I": N. *nē* "I") seem to be historically connected with the Nahuatl *saltillo* (or *salto*).

Abstracting, then, from aspirated, palatalized, geminated, spirantized, nasalized, and glottalized consonants as being all of more or less secondary origin, we have left in Southern Paiute for specific comparison with Nahuatl consonants only *p, t, q, qw, tɔ-ts, ɔ-s, m, n, η, w, y, and ɔ'*.

Nasalized and Geminated Consonants in Shoshonean.—Before deciding what are the Uto-Aztekian prototypes of the primary Nahuatl and Southern Paiute consonants, we may ask whether it is possible to define the phonetic conditions, from a Uto-Aztekian point of view, under which consonants became spirantized, geminated, or nasalized in Southern Paiute (or Shoshonean generally). The spirantized consonants, which arose also in other Shoshonean dialects (e. g., Shoshone), are easy enough to understand; they doubtless arose regularly whenever a non-initial consonant came to stand immediately after a vowel.

The nasalized stops are to at least some extent also intelligible. In some cases, as we have seen, the nasal of the stem assimilated to itself the consonant of the suffix by affecting it with its nasal quality (e. g., *nīηwū-ntsi-* "person"; *nū'qwi-nti-* "flowing, stream"; *taηwa-*

mpi- "tooth"; *siŋwa-mpu-* "sand"); yet this is not observed in all such stems, even where the suffix frequently occurs in nasalized form in other stems (e. g., *mɔ'ɔ-vi-* "hand" with spirantized, not nasalized, form of suffix *-pi-*; *muvi-p'i-* "nose" with geminated form of same suffix).

We have already seen reason¹ to believe that the nasalizing power of *vi-* "stick" goes back to an old nasal at the end of the stem that has disappeared as such. If *vi-* (plus its nasalizing power) corresponds in all respects to N. *uapali-* "planché," we must suppose that final *i* of **ɔpin'i-* was syncopated and that *-n-*, not being able to stand at the end of a word, could maintain itself only when followed by a stopped consonant, in other words, lingered on as a nasalizing peculiarity of the stem. There is no doubt, from comparative evidence, that there are several cases in Southern Paiute (and other Shoshonean dialects) of nasalized consonants resulting from the syncope of a vowel between an original nasal (*m*, *n*, or *ŋ*) and a stopped consonant. Such are:

S. P. *pa'a-nti-* "high" (< **pa'an'i-ti-*; *-nti-* is participial): N. *pani* "en haut, au sommet"

S. P. *tümpi-* "stone" (< **tima-pi-*), *tüŋqan'i-* "cave" (< **tima-qan'i-* "stone house"); Tüb. *dün-t* (< **düma-t*): Ser. (H.) *düma-t*; Git. *dümu-t*

S. P. *tunqu'ü-* "to get clumsy" (< **tuma-qu'tü-*): N. *toma-ua* "grossir, devenir gros"

S. P. *tümpa-* "mouth" (< **tini-pa-*): Fern. *töŋi-*; Cora *teni*; Pap. *tšihNI*

S. P. *-šampa-* "only, except" (< **-šan* + some vowel *-pa-*): N. *çan* "only, but" (< **san* + some vowel). This example only implies syncope; at any rate, it clearly indicates that S. P. *mp* is etymologically *-n* (or *m*, for *-m* becomes *-n* in N.) + *p*-

S. P. *nɔnti-* "to fly" (< **nɔn'i-tsi-*): Ser. (H.) *hinyi-k*; Cora *eni-te*; Pap. *nühNI* "to fly up, fly away (pl.)"

S. P. *miŋwā-* "(frightened animals) come out in one bunch" (< **min'i- gwā-*): N. *mi-miloa* "bouleverser" (< **mi-mili-wa*, reduplicated)

S. P. *naŋqá-va-phi* "ear," *naŋqa-q'ai-* "to hear" (< reduplicated **nanaga-*): Fern. *nänak*; Tep. *nanaca*. Unreduplicated *naka-* is more common: N. *nacaz-tli*; Tar. *naka*; Pap. *nahkü*

S. P. *ampaya-* "to talk" (< **am'ɔ-paya-*): Pap. *ammoh* "to talk loud" (< **am'ɔ-*)

In many cases, however, I can give no reason for the occurrence of the nasalized stop. Such are:

¹ Part I, p. 401.

S. P. *tuyumpa-* "sky"; Shosh. *togumba-*; Tüb. *dogumba-l*: Möh. *duguba-t*; Gabr. *tukupa-r*
 S. P. *paya-mpu-* "reed": Cora *haká*; N. *aca-il*
 S. P. *oyo-mpu-* "fir": Cora *huku* "Kiefer"; N. *oco-il* "pinus tenuifolia"
 S. P. *k'wi'tu-mpi-* "anus"
 S. P. *wiγA-mpi-* "vulva"

This Southern Paiute (to what extent it is general Shoshonean cannot at present be stated) law of vocalic syncope in the neighborhood of a nasal consonant may explain also *-yai-* (*-q'ai-*, *-ηqai-*) "to have" as compared with its participial form *-ya-nti-* (*-q'a-nti-*, *-ηqa-nti-*) "having," original **-kani-* regularly becoming **-kai->-yai-* (see below under Uto-Aztekan *n*), while **-kani-ti-* with loss of *i* develops into **-kanti->-yanti-*; similarly, perfective *-q'ai-* (as in *-q'ai-n'a-* "what has been -ed") as compared with its participial form *-q'a-nti-* "having been -ed." Under what circumstances this vocalic syncope takes place is still undetermined.

Still another set of Southern Paiute nasalized stops is due to reduplication, inasmuch as stems with nasal as their second consonant reduplicate both first and second consonants; examples are *qanqánⁱ* "houses (distributively)" from *qanⁱ* "house," and *pumpun^{n'i}kva'* "to see (plural subject)" from *puník'va'* "to see."

These three causes, then—assimilation to nasal of stem, syncope of vowel following nasal, and reduplication—may, in the present state of our knowledge, be advanced as responsible for the presence in Shoshonean of nasalized stops. They are clearly not, any more than the spirantal developments of stopped consonants, to be attributed to original Uto-Aztekan.

A far more difficult problem is presented by the geminated stops, which are known to exist not only in Southern Paiute but in other Shoshonean dialects as well.¹ As far as can be seen at present,

¹ In Northern Paiute, a dialect of the Mono-Bannock group, for instance, it is necessary to distinguish after vowels between lightly stopped fully voiced consonants (etymologically parallel to Shoshone, Ute, and Southern Paiute voiced spirants) and firmly stopped geminated consonants (see T. T. Waterman, *The Phonetic Elements of the Northern Paiute Language*, University of California Publications in American Archaeology and Ethnology, vol. 10, 1911, p. 33). In some Shoshonean dialects (e. g. Uncompahgre and Southern Ute) nasalized stops developed into geminated stops, thus falling together with the old geminated stops (see, e. g., J. P. Harrington, *The Phonetic System of the Ute Language*, University of Colorado Studies, vol. VIII,

Shoshonean geminated stops have exactly the same reflexes in Nahuatl and Sonoran as the simple stops (S. P. postvocalic spirants). Yet there is little doubt that we are here dealing with one of the fundamental points of Shoshonean phonology. Despite the very fragmentary data at hand, I believe it can be demonstrated that the geminated stops exist not only in Plateau Shoshonean but also in Tübatulabal and Luiseño-Cahuilla. S. P. *r*, the spirantal development of original *t*, is paralleled in these two Shoshonean groups by *l*; e. g., Tüb. *šulu*- "nail" <**sutu*- (cf. Tar. *sutu*), Cahu. *kelawat* "wood" <**keta*- (cf. Fern. *kota*). Now it is extremely suggestive to note that the difference between the noun endings *-l* and *-t* in Tübatulabal and Luiseño-Cahuilla may be interpreted as due to the influence of a preceding spirantizing and geminating stem respectively. Thus, we are dealing with spirantizing stems in A. C. *hu-l* "arrow" (cf. S. P. *u-γun'a-* "quiver," literally "arrow-sack," *γun'a-* "sack" being spirantized to *-γun'a-* by preceding *u-* "arrow"); Cahu. *pa-l* "water," Tüb. *ba-l* (cf. S. P. *paγári-ri* "lake," literally "water-sitting," from *pa-+qari-* "to sit"); Cahu. *eŋi-l* "salt," Tüb. *uŋa-l* (cf. S. P. *za-vi-* "salt," *-vi-* being spirantized from *-pi-*); Tüb. *nüba-l* "snow" (cf. S. P. *niva-vi-* "snow"); Cahu. *wewa-l* "rain" (cf. S. P. *uŋwa-ri-* "raining, rain" <original stem **uwa-* +spirantized form of participial *-ti-*). On the other hand, we seem to be dealing with geminating stems in Cahu. *duku-t* "wildcat" (cf. S. P. *t'ʷu'qu-p' u-ts'* "wildcat"; *t'ʷu'qu-m' umu-ts'* "panther," with *-m'*, not *-nw-*); A. C. *alwa-t*, *alwu-t* "crow" <**atwa-* (cf. S. P. geminating *at'a-* in *ʷa'tá-p' u-ts'*, *ʷa'tá-q' wo-ts'* "crow"); A. C. *muu-t* "owl" (cf. S. P. *moó-p' u-ts'* "owl"); Tüb. *gu-t* "fire," Cahu. *ku-t* (cf. S. P. *qu'n'a-* "fire," with geminated *-n'-*; *qu-*, geminating verb prefix "by means of fire"); Cahu. *kumi-t* "smoke" (probably cognate with Mono (N. F.) reduplicated *gukuhí-p* "smoke," *-kuhi-* being identical with S. P. *kwí- <*kuhi-* in *kwí-k'ʷa-ri-* "smoke" with geminated form of *-qa-* suffix; Cahu. *-m-*: Plateau Shoshonean *h*, zero, is perhaps paralleled by Cahu. *yamiš-* "mountain": S. P. *qai-* in *qaiva-* "mountain" and Möh. *gai-tc* "mountain");

1911, in which no mention is made of nasalized stops, Harrington's material being taken from Southern Ute). These secondary geminated stops are naturally of no further interest here.

Cahu. *samu-t* "grass" (cf. Shoshone *səni-p* "grass," Shoshone *-p* evidently corresponding to geminated form of S. P. *-vu-*, *-p'v-*, *-mpv-*, noun suffix regularly used for plants; for Cahu. *-m-*: Shoshone *-n-*, cf. A. C. *-tami* "knee": Tüb. *toŋo-*, Cora *tunu*). There is, as might indeed be expected, some conflicting evidence to contend with (e. g., Luis. *hunwo-t* "bear": Tüb. *una-l*), but I believe the case is strong that Luis.-Cahu. and Tüb. *-l* : *-t* corresponds exactly to the Plateau Shoshonean difference between spirantizing and geminating elements.

While, then, geminated stops doubtless form a fundamental class of sounds in Shoshonean phonology, we are quite at a loss, as already noted, to find reflexes for them in Nahuatl and Sonoran. The following examples illustrate this:

S. P. *t^uqwa-* "deep" = *tuq'a-*: Cora *tika-niše* "in der Tiefe"

S. P. *tuywa-* "to be dark, night" (< **tuka-*); Tüb. *duga-l* "night": Cora *tika* "Nacht sein"; Pima *tšoka-* "night"

S. P. *tuywa-* "to put out the fire," *tuywi-* "the fire goes out" (< **tuka-*, **tuki-*): N. *toquia* "attiser le feu"; Pap. *tšuh* "to stop burning of itself," < **tuki-*

Note that Cora *tika-* corresponds to both S. P. *tuq'a-* and *tuya-*.

S. P. *t^uγā-* "to measure, try": N. *tecu* "poser des pierres, construire, planter"; Pap. *tšuh* (< **tika-*) "to put away"

S. P. *t^uq'a-* "to eat" = *tuq'a-*: Pap. *tšuh* "to taste" (< **tika-*)

Note that Pap. *tšuh* corresponds to both S. P. *tuq'a-* and *tuya-*.

S. P. *t^ušu-* "to grind seeds" (< **tuš'u-*): N. *teci* "moudre le mais sous la pierre"; Pap. *tšuz* "to grind" (< **tusi-*)

Note that Pap. *tšuz* here corresponds to S. P. *tuš'u-* with geminated consonant, *tšuh* to S. P. *tuya-* with spirantized consonant.

S. P. *n^uqwi-* "to stream" = *nuq'i-*: N. *noquia* "verser une chose, avoir la diarrhée"

Note that N. *noquia* seems to rime perfectly with *toquia*, despite S. P. *nuq'i-*: *tuya-*.

S. P. *s^u-* "cold," regularly geminating following consonants: N. *ce-il* "glace"; Pap. *hü-hpih* "to become cold"; Cora *sē* "es es kalt"

In the following examples, S. P. *š* and *q* (?) correspond to Pap. *hh*. Whether this is of any consequence as regards our problem I cannot say, though I should hardly be inclined to attach much importance to it.

S. P. *t^uq'úa-phi* "meat" = *tuq'ua-*: Pap. *tšūhhu'kū* "meat" (< **tuk'u-*?)
 S. P. *q'wa'shí-phi* "tail" < *qwaši-*: Cora *kwasí* "der Schwanz der Tiere"; Pap. *pahhi* "tail" (< **kwasí* i)

So far, we must conclude, the existence of a definite series of geminated stops has been demonstrated only for Shoshonean. These, then, like the nasalized stops, must be considered a specifically Shoshonean development (or Uto-Aztekian feature retained only in Shoshonean?).

UTO-AZTEKAN CONSONANTS

Comparison of Nahuatl, Sonoran, and Shoshonean consonants leads to the setting up of fourteen, possibly only twelve, distinct consonants. These are *p*; *t*; *tl*; *tš* (of which *ts* may be considered as variant); *k*; *kw*; *s* (of which *š* may be considered as variant); *m*; *n*; possibly *η*; *l*; *w*; *y*; and possibly *h*. It is very doubtful if also the glottal stop (') is to be assigned to the Uto-Aztekian period. The Uto-Aztekian consonants will now be taken up in that order.

Uto-Aztekian p.

Initial Uto-Aztekian *p* ordinarily appears as N. *p*, Cora *h* (*x*) and *p*, Shoshonean *p*, Pap. *v* (before *a* and *i*) and *w* (before *o*, *u*, and *ü*).¹

N. *poc-tli* "smoke, vapor, fog, mist," *popoca* "fumer, jeter de la fumée": S. P. *paxi-n-a* "fog"; Cahu. *paxi-š* "fog"; Fern. *paki-t* "cloud"
 N. *počaua* "s'enfler," *počati* "se gonfler de nourriture"; Cora *huša* "gesättigt sein, sich sättigen": S. P. *p^utša-* "to be filled up"
 N. *pia*, *pie* "garder quelqu'un; mettre en réserve"; Pap. *vih* "to stay, be left," *viah* "to leave something purposely": S. P. *piyai-* "to be left remaining"
 N. *pellā-ni* "se verser, se répandre (en parlant d'un liquide)," frequentative *pepetla-ca*: S. P. *pāra-ya-yi-n-i* "rain is pattering"
 N. *pauia* "mâcher" (transitive in *a*, perhaps originally meaning "to cause to go down one's throat"): S. P. *paŋwi-* "throat" (< **pawi-*); A. C. *-pava* "throat"
 N. *pani* "en haut, au sommet": S. P. *pa'ántⁱ* "high"
 N. *paina* "courir vite"; Pap. *wōhpū* "to run (plur.)" (< **pōi-kwī-* ?): S. P. *pōya* "to run about" (< **pōi-na-* ?)
 N. *pipina* "sucer des cannes à sucre," *pipinia* "s'imprégnner d'humidité": S. P. *piyá-phi* "sap, juice"
 N. *pī-lli* "elder sister": S. P. *pia-* "mother, female;" S. J. C. *pī-t* "younger sister"

¹ Dolores, *Papago Verb Stems*, p. 242.

N. *pil-li* "son, child"; Cora *péri*, *pári* "Sohn, Tochter, Kind, vom Vater gesagt":
 A. C. *pulyini-š* "baby" (*pulyi-* = *pulv-i-*)
 Cora *-poa* in *ki-pca* "Haar"; Pap. *wohphoh* "hair on the skin" (< **p̥oa-kwɔ-*?):
 S. P. *p̥uā-* "hair, fur"; Fern. *p̥uā-* "head"; Gabr. *p̥wa-* "head, hair"
 Pap. *vah* "to go in" (< **paka*): S. P. *p̥aya-*, *p̥ayai-* "to go, walk"
 Pap. *vahm̥i* "to rise from lying" (< **pami*): S. P. *p̥aŋwi-* (< **pami-*) "(lying)
 on one's belly"
 Pap. *vai* "to call" (< **pai*): S. P. *p̥ai-* "to call"
 Cora *hure*, *-xure* "eine Kugel, einen Ball machen" (< **pole*?): S. P. *p̥ol'·o·-qwa-*
 "to be round"
 Cora *hiwe* "nach einem schreien, brüllen" (< **p̥uwe*): S. P. *p̥uŋ'wi-* "to make a
 peeping noise"
 Cora *héika* "töten" (with singular object) (< **paika*?): S. P. *p̥aq'a-* "to kill
 one"

Under as yet unknown conditions initial Uto-Aztekian *p̥* became *h* not only in Cora¹ but also in Nahuatl (and Huichol), where it then disappeared. Examples of N. zero, Cora *h-*: Pap. *v-*, *w-*: Shoshonean *p̥-* are:

N. *aca-tl* "roseau" (< **paka-*); Cora *haká* "das Schilfrohr"; Pap. *va-p̥ak*
 "reed"² (doubtless reduplicated from **vak*): S. P. *p̥aya-mp̥u-* "reed"
 N. *āch-tli* "frère ainé" (< **patsi-*); Cora *ha*, *has*, *hatsi(n)* "älterer Bruder";
 perhaps also Huich. *matzi* "frère ainé": Cahu. *p̥as* "elder brother";
 S. P. *p̥avi-* "elder brother," *patsi-* "elder sister"
 N. *ix-tli* "face, visage, ocil" (< **usi-* < **pusi-*); Cora *hisi*; Huich. *utši*, *huži*
 (so I understand Duguet's *hougy*); Tar. *pusi*; Cah. *pusi*; Pap. *wui*
 S. P. *p̥u'i-phi* "eye"; Tüb. *puntsi-* (why nasalized *-nts-*?); Cahu. *-pus*
 N. *ð-lli* "path, road" (< **p̥oi-* or **p̥oe-*); Cora *huyé* "Weg"; Tepecano³ *wi*, plur.
wóp̥i; Pap. *wō'KÜ* "road, trail," *wō'-kah* "to have a road" (*wō-* < **p̥oi-*,
 cf. Pap. *wō-* < **p̥oi-* in *wōhp̥ü* above): S. P. *p̥o-* "trail"; Hopi *p̥i-hü*;
 Cahu. *p̥i-t*
 Huich. *ya* "tobacco" (< **ihā*, dissimilated from **hiha* < *pipa*?); Cora *ya-na*
 "Tabak rauchen"; Tep. *viva* "tobacco"; Pap. *vihwü* (> **pipa*):
 Hopi *p̥iva* "tobacco;" Möh. *p̥iva-t*; Luis. *p̥iva-t*. Uto-Aztekian
**pipa*
 N. *ā-tl* "water"; Huich. *ha*; Cora *ha*; Cah. *ba*: S. P. *p̥ā-* "water"; Tüb. *pa-l*;
 Git. *bā-tc*; Gabr. *pa-r*; Cahu. *pa-l*

It is remarkable that in certain derivatives of Uto-Aztekian **p̥ā-* "water" Nahuatl has preserved *p̥*, e.g. *p̥ati* "se fondre, se liquéfier,"

¹ It is not clear to me when original *p̥* remains as such (or as *w*?) in Cora and when it develops to *h*. Perhaps it regularly becomes *h* (*x*) before original *a*, *o* (Cora *i*), *ɔ* (Cora *u*), but remains *p̥* (or *w*?) before original *i* and *e* (N. *e*, Pap.-Shoshonean *i*).

² On Dr Mason's authority.

³ Information obtained from Dr J. A. Mason.

se mettre en eau" (*-ti* "to become"). I can suggest no reason for this curious fact.

To judge from the one example available, this N. *h* < *p* was shifted before *e* to *y*, which then remained (though variants without *y*- also occur, significantly enough):

N. *ye(i)*, *e(i)* "three" (< **hei* < **hai* < **pai*); Cora *wáj-ka* (perhaps changed from **pai-* by analogy of *wa-* "two"); Tar. *bai-ka*; Cah. *bahi*; Pima *vai-* (< **pai-*); S. P. *pai-* "three"; Tüb. *pai*; Git. *bahi*

After vowels, Uto-Aztekian *p* appears in Southern Paiute as geminated *p'*, spirantized *v*, or nasalized *mp*. Examples of geminated *p'* are:

N. *pichauh-tica* "être engourdi, transi, mort de froid"; *pichaui-liztli*, *pichagui-liztli*, "flétrissure, engourdissement": S. P. *t^a-p^ait'ca-* "to crush by trampling" = *ta-p^ait'ca-* (geminating *ta-* "by means of the feet")
 N. *-pa*, *-ppa* "so and so many times," suffixed to numeral stems (e. g. *ce-ppa* "once," *o-ppa* "twice," *malac-pa* "ten times"; has *-ppa* original geminated *pp*, or is *pp* developed from **cem-pa*, *om-pa* ?): S. P. *-p^aa*, *-p^aa-* "in (this, that) way"
 Pap. *va'kū* "hole": S. P. *o'páq'-i* "hole" = *o-paq'i-* (with geminating prefix *o-*)
 Cora *táxis*, *táxix* "aufwachen" (< **ta-pus*, **ta-pu*); Pap. *wuhha* "to awaken" (< **pus'a*): S. P. *t^u'pu-n'ni-* "to wake up" = *tup'u-n'ni-*
 Cora *kípi* "sich niederlegen zum Schläfen" (< **hupi* ?): S. P. *'a'pvi-* "to sleep" = *ap'vi-* (< **hap'ei*- or *hap'eni*-?)

Examples of spirantized *v* are:

N. *paca* "to wash;" Tar. *pago-ta*: S. P. *na-vaq'i-* "to bathe oneself" (spirantizing *na-* is reflexive; *pay'i-* does not occur without prefix in S. P.)
 N. *uapal-lí*, *uapali-il* "planche, ais, petit poutre, bois"; Pap. *ov'rtši* "awl": S. P. *xi-* "wood"
 N. *tlapcopa* "orient, levant" (< **tlapa-* or **tlapi-*, old stem for "sun"; *-copa* "de, par, vers"); Huich. *tau* "sun" (< **tawa* or *-i* < **tapa* or *-i*); Cora *táy-ni* "sun" (antiquated): S. P. *tava-* "sun"; Hopi *dawa*; Ban. *taví*. Probably *-m-* of Git. *damia-t*, Gabr. *tami-t*, Cahu. *dami-t* is also developed from this intervocalic *-p-*
 N. *tepitzin* "peu, petit" (*-zin* probably diminutive): S. P. *tivitsi-* "very"
 N. *tepe-ił* "mountain"; Pap. *tšúwuh̥t* "dirt, earth, world": S. P. *tivi-p'u-* "earth"; Hopi *döva* (< **tepa*); Git. *düva-tc*; Cahu. *tema-l* (*-m-* as in *dami-t* above)
 N. *-pa* local suffix of indefinite meaning (e. g. *cam-pa* "where, whither"; *ne-pa* "here, there"; *ipam-pa*, *pam-pa* "because"; *om-pa* "where"); possibly Cora *he-* (< **pa-* ?) in *hemi* "vor," *hete* "unter," *hetsán* "auf": S. P. *-vā-*, *-va-* "in, at"

N. *-pan* "upon;" Cora *ha-poa(n)* "auf, in, über": S. P. *-v'an'a*, *-va'an'a*,
 N. *-cpac, -ti-cpac* "sur, au-dessus, en haut" (probably compounded of *-c, -cc*
 "in" and **-pac*): S. P. *-v'āyi*, *-va'āyi* "over" (< **-p'āki*)
 Cora *tawi* "sich niederlegen" (sing. subj.) (< **ta-awi* < **-api*? cf. *taw-* < **tawa-*
 "sun" < **tapa-* above): S. P. *avi* "to lie" (sing. subj.)

Examples of S. P. words with nasalized *mp* corresponding to Nahuatl or Sonoran forms seem hard to find.

Uto-Aztekan *t* and *tl*

To Nahuatl *tl* regularly correspond in all Shoshonean and Sonoran dialects reflexes of Uto-Aztekan *t*; in other words, it is possible to keep apart Uto-Aztekan *t* from *tl* only in Nahuatl itself (in Pipil and Nahuatl dialects spoken in Oaxaca, however, *tl* has developed to *t*). It is possible to formulate some law accounting for N. *tl* as developed from original *t* according to certain phonetic circumstances, we could dispense with a Uto-Aztekan *tl*. As this cannot be done, it seems necessary to assume Uto-Aztekan *tl* as well as *t*. It may be that more complete and carefully sifted evidence than can now be presented will later show that the reflexes of Uto-Aztekan *t* and *tl* are not always identical even outside of Nahuatl itself.

Examples of Uto-Aztekan *t*: S. P. (Shoshonean) *t* initially are:

N. *toquia* "attiser le feu"; Pap. *tshuh* "fire goes out" (Pap. has regularly *ts* before *u*, *ü*, and *i*, but *t* before *a* and *o*)¹: S. P. *tuγwa-* "to put out the fire," *tuγwi-* "fire goes out"

N. *tegui* "couper": S. P. *tīγu-n'ni-* "to butcher (meat)"

N. *te-tl* "stone"; Cora *teté*: S. P. *ti-* "stone"; Fern. *to-ta*

N. *tepe-tl* "mountain"; Pap. *tcīwūht* "earth": S. P. *tīvi-* "earth"; Cahu. *tema-l*

N. *topeua* "pousser, arracher une chose"; Pap. *tshūvaim* "to drag": S. P. *tīva-* "to come loose." Uto-Aztekan **tope-*, *tēpa-*

N. *tiça-il* "sorte de vernis, terre ou poudre blanche"; Pima *tāhai* "white"; Huich. *tousa* "blanc"; Cah. *tosa-li*: S. P. *tshā-* "white"

N. *ten-tli* "lips, mouth"; Cora *téni*: S. P. *tūmpa-* "mouth"; Fern. *-tōṇi-*

N. *toch-tli, tochin* "lapin": Luis. *dosi-xi-t* "rabbit"; Gabr. *tošo-xo-t*

N. *tema* "remplir une chose de semence ou de terre": S. P. *tīṇwa-* "to cover up, close up (hole)"

N. *tēhuān* "we," *tech* "us"; Tar. *tame*: S. P. *taṇwa-* "we (inclusive)," *tam-i-* "we two (inclusive)"; Hopi *ti-tamō*

¹ Dolores' *ü* is identical with our S. P. *ü*, both corresponding to Nahuatl *e*.

N. *teci* "moudre le mais sous la pierre"; Pap. *tšui*: S. P. *t^ušu-* "to grind seeds" N. *te-, tequi-* "beaucoup, extrêmement": S. P. *ñ-* "much, greatly"

N. *teneua* (refl.) "se nommer, être appelé," *teneui* "devenir illustre": S. J. C. *-t^uuη* "name"; Fern. *-tuano-* "name"

Examples of Uto-Aztekian *tl-*: S. P. (Shoshonean) *t* initially are:

N. *tlāca-il* "person"; Cora *tāta* "Mann": Hopi *tlāqa* "man"; A. C. *-tax'a* "person"

N. *ila* in *tlāneci* "to dawn," *tlathui* "to dawn, become light": S. P. geminating *ta-* in *t^a-šia-* "to dawn"

N. *tlap-copa* "orient, levant"; Cora *tay-ni* "sun": S. P. *tava-* "sun"; Hopi *dawa;* Tüb. *da-l;* Gabr. *tami-t*

N. *tlēco* "monter"; Pap. *tšūhš* "to go up, climb, ride": S. P. *ñ-* "up," *tuγu-mpa-* "sky"

N. *tlan-tli* "tooth"; Cora *tame*: S. P. *taŋwa-* "tooth"; Hopi *tama*; Tüb. *dama-*; Fern. *-tama*

N. *tlan-quaitl* "knee"; Cora *tunú;* Pap. *tohnü*: S. P. *taŋa-* "knee"; Hopi *dami;* Tüb. *toŋo-;* Git. *-tama*

Examples of Sonoran *t-*: Shoshonean *t-* are:

Huich. *tope, topi* "arc": Luis. *kutapi-š* "bow"; A. C. *gutapi-š;* S. J. C. *-gutup*

Cora *tíka-ntše* "in der Tiefe"; perhaps also Pap. *tšuhPI* "to sink": S. P. *t^uqwa-* "to be deep"

Cora *tevi* "der Mensch, die Person" (< **tewi*), plur. *táite;* Pima *tiwo-t;* Pap. *tšúo-rši* "man, male": S. P. *taŋ'wa-* "man" (< **la'wa-*); Tüb. *datwa-l* (misheard for *ta'wa-l*?). Uto-Aztekian **tewa* or **tlewa;* Shoshonean **ta'wa-* assimilated from **tl'wa-*?

Huich. *touhou* (i. e. *tuhu*) "braise": Ser. (H.) *tuu-tv* "coal"; Fern. *dūu-t;* Luis. *du-la;* Tüb. *duldul.* S. P. *tō-q'a-* "to be black" may be derived, with suffixed adjectival *-q'a-*, from this stem; "black" < "coal-colored"

Huich. *tagui, tahoui* (i. e. *tawi*) "poitrine"; Cora *tabi:* Cahu. *-tau, -tawh* (i. e. *-taW*) "breast"

Cora *téne* "in Stucke schlagen": S. P. *tna-a-* "to punch"

Cora *tíka* "Nacht sein"; Pima *tšoka-ŋgi* "night": S. P. *tuγwa-* "to be night"; Wob. *toxa-wan* "night"; Tüb. *duga-l;* Luis. *duku-mi-t*

Pap. *tšūhhu'KÜ* "meat" (< **tuk'u-?*): S. P. *t^uqua-* "meat"

Pap. *taht* "foot," *ta'tü-wuah* "to put the foot in something": S. P. *ta-* "with the foot"

Pap. *tšu'ihrši* "to ask a question" (< **tu'i-* < **tivi-* ?): S. P. *tivi-* "to ask"

Pap. *tšūh* "to taste": S. P. *t^uqa- = tīq'a-* "to eat"

Pap. *tšüi* "to say": S. P. *tin'ia-* "to tell"

In these, owing to lack of Nahuatl evidence, we cannot at present tell in which cases we are dealing with Uto-Aztekian *t-* or *tl-*.

After vowels, Uto-Aztekian *t* and *tl* appear in Southern Paiute as geminated *t'*, spirantized *r*, or nasalized *nt*. Examples of N. *-t-* corresponding to all three of these forms are:

N. *-ton-tli* "suffixe marquant la petitesse": S. P. *tua-* "child, son"; as diminutive suffix *-t'ua-*, *-rua-*, *-ntua-* "small, young of." Uto-Aztekian **tona-*
 N. *-ti-* "particule servant à unir les verbes avec les verbes irréguliers," *-ti-c* adjectival suffix: S. P. *-ti*, *-ri-*, *-nti-* suffix of present participle. It is quite doubtful, however, if these elements are really cognate
 N. *-ri* "to become": S. P. *-t'ui-*, *-rui-*, *-ntuui-* "to become, turn into"
 N. *-tech* "dans, sur, à, de, près": S. P. *-t'uywa-*, *-ruywa-*, *-ntuywa-* "to" (probably compounded of two postpositive elements **-tu* and **-ya-*)

Similar in form to these, but corresponding, it would seem, to N. *-tl-*, is:

N. *-tloc* "with, near to"; Huich. *-touha* (i. e. *-tuha*) "au bas" (cf. adverbs *ha-toua-na*, *ha-tou* "dessous," *rhe-touha* "en bas, sous"): S. P. *-t'ug'wa-*, *-rug'wa-*, *-ntuug'wa-* "under"

Whether Uto-Aztekian *-t-* or *-tl-* is to be assumed is uncertain in:
 Pap. *-tšu* "to make, to make for": S. P. *-tu-*, *-ru-*, *-ntu-* "to make"

Examples of S. P. geminated *-t'-* corresponding to N. *-t-*, *-tl-* are:

N. *-tia* causative suffix; Cora *-te* causative: S. P. *-t'ui-*, *-t'ii-* causative
 N. *-tla* "qui sert à marquer abondance, quantité" (e. g. *te-tla* "lieu pierreux"); Cora *-ta* (e. g. *sā-ta* "sandiger Ort"): S. P. *-t'ia-* "place of"

Examples of S. P. spirantized *-r-* corresponding to N. *-t-*, *-tl-* are:

N. *cat-qui* "to be (in a place)," *catē* (present plural): S. P. *gari-* "to sit, dwell"; Hopi *gatō* "to sit"
 N. *coto-na* "couper, mettre en morceaux quelque chose, cueillir des fruits": S. P. *ts'-qur'u-* "to tamp (tube) by pushing (stick) back and forth"
 N. *metla-tl* "metate"; Huich. *mata*; Pap. *mah'tšuhṭ* "grinding [stone, metate]": S. P. *mara-*; Luis. *mala-* (*-l* < *-t-*)
 N. *petlā-ni* "se verser, se répandre (en parlant d'un liquide)": S. P. *pāra-xa-* "rain patters"
 N. *quetl* (poetic form of *quetza*) "to arise from": S. P. *qwiri-* "to get up"

Before and after *i* Shoshonean *-t-* (whether from Uto-Aztekian *-t-* or *-tl-*) becomes S. P. *-tš-*, *-ts-*. Thus, after *i*, present participial *-tii-* appears as *-tšii-*, *-ntšii-*; *-tuγwa-* "to" as *-tšuγwa-*, *-ntšuγwa-*; *-tu-* "to make" as *-tšu-*, *-ntšu-*. Further examples are:

N. *izte-il* "nail"; Cah. *sutu*; Pap. *hurši* (< **suti*): S. P. *šiišu-* "nail, claw" (< **situ-*); Tüb. *šulu-* (< **sutu-*)
 N. *cuitla-il* "excrement"; Cora *tšuita* "Exkreme von Menschen und Tieren"; Pap. *pīht* "manure" (< **kwita-*): S. P. *qvitša-* "to defecate"

N. *-tl*, *-tli* noun ending: S. P. *-tsi-* noun ending; Cahu. *-t*, *-l*, *-š* (after *i*, e. g. *ki-š* "house," *yunawi-š* "buzzard," *qawi-š* "rock;") this *-š* goes back to *-tš*, as shown by comparison with Luiseno); Luis. *-tša* (after *i*), *-la* (both from **-ta* < **-tla*, form parallel to **-tli*); Tüb. *-l*

Pap. *kütšah* "semen," *kütši-wuah* "to emit seed" (< **kiti-*): S. P. *qit'si-* "saliva" (< **kit'i-*)

It is not quite clear whether S. P. *tš* has developed from *tl* > *t* before original *i* or *i* in:

N. *atla-tl* "spear-thrower": Hopi *auta* "bow"; S. P. *'atši-*; Kawaiisu¹ *etü*; Bank. *āli-t*

N. *tl* and S. P. *tš* may possibly also correspond in:

N. *tle* "que? quelle chose?" *a-tle* "rien" (literally "not-what"): S. P. *-tšu-* in *qa-tšu-* "not" (extended form of negative *qu-*); Ute *qa-tši-* (= Uto-Aztekian **ka-tle-*); Mono (N. F.) *ga-du-*

N. *uitallō-tl* "espèce d'oiseau tres-allongé, volant peu mais courant extrêmement vite": S. P. *wut'ša-* "roadrunner"

Nahuatl *t*, originally followed by now elided *i*, has become *tš* (*ch*) in:

N. *oquich-tli* "homme, mari mâle": Cahu. *qeat*, *kiat* "boy"; Fern. *koti* "young man"

N. *quech-tli* "neck" (< Uto-Aztekian **keti-*): A. C. *-qelyi* "neck"; S. P. *qura-*. N. *quech-* may, however, go back to Uto-Aztekian **ketše-* (assimilated from **kotše-?*), cf. Pap. *kuhšüwoh* "neck" (< Uto-Aztekian **kotše-*) and Tepecano *kušuá* "neck"² (< Uto-Aztekian **kotšo-* assimilated from **kotše-*), which forms are in turn perhaps to be compared with Cahu. *quspi* "throat" (see under Uto-Aztekian *k*: Cora *kipi*)

Uto-Aztekian *tš*, *ts*

While S. P. *tš* not infrequently, as we have seen, goes back to Shoshonean *t*, whether in turn developed from Uto-Aztekian *t* or *tl*, and N. *tš* (*ch*) also in certain cases is developed from *t*, there remains another series of examples in which N. *ch*, *tz* correspond to S. P. (Shoshonean) *tš*, *ts*. These justify us in assuming an original Uto-Aztekian *tš* (*ts*). N. *ch* and *tz* both occur freely, and I can give no rule that would clearly indicate that they are variants of one prototype (compare, however, *mi-tz* "thee" with *te-ch* "us"). It may be that we should assume two distinct affricative sibilants, *tš* and

¹ Californian dialect of Ute-Chemehuevi group.

² On Dr Mason's authority.

ts, for Uto-Aztekian, though I should be inclined at present to doubt whether this would be correct. In Southern Paiute *tš* and *ts* vary primarily according to mechanical phonetic rules, *ts* always standing instead of *tš* before *i*. Similarly, in Papago *š* represents original *tš* before *a*, *o*, and *u*, while it is replaced by *s* before *i* and *ü* (examples of Pap. *š* corresponding to N. *tz*, *ch* are: N. *chocoa* "to cry": Pap. *šohšah*; N. *metzli* "moon": Pap. *mahša't*).¹

Examples of Nahuatl *ch* corresponding to Shoshonean *ts* are:

N. *chichi* "dog" (assimilated from **kutši*); Tar. *koktši*; Cora *kítsi* "das Haus-tier": Git. *gutsi* "dog"; Möh. *gutši*; Ser. (H.) *kwutši*
 N. *pichauh-tica* "être engourdi, transi, mort de froid," *pichaui-liztli* = *pichaqui-liztli* "flétrissure, engourdissement": S. P. *t^a-pit'ša-* "to crush by trampling" (*ta-* "by trampling")

Examples of Nahuatl *tz* (Pap. *š*) corresponding to Shoshonean *tš*, *ts* are:

N. *-tza* frequentative transitive suffix with verbs expressing sounds and various activities (e. g. *cocomo-tza* "hacer estruendo con los pies" from *comō-ni* "hacer ruido alguna cosa pesada que cae"; *popolo-tza* "hablar a otro en lengua barbara" from *polō-ni* "hablar barbaramente")²: S. P. *-tša-* frequentative transitive suffix (e. g. *ts^a-k^uavi-tša-* "to cut several things," *tš^a-qoi-tša-* "to take off several articles of clothing")
 N. *tzon-tli* "hair;" Cah. *tšoni*: Mono (In.) *tsobip* "hair"; Tüb. *tsom'o*; S. P. *tšo-* (Ute *tšu-*) "with the head," *t^at'si-* "head" (perhaps dissimilated from **tsot'si-*)
 N. *-tzin* (vocative *-tze*; plural *-tzitzin*) suffix indicating reverence, respect, endearment, originally doubtless diminutive, as in *uitzi-tzi-lin* "oiseau-mouche" (from *uitzi-lin*; see below); Cora *-tsi(n)* diminutive suffix (as in *hátsi*, *hátsin* "older brother"; *hátsi* "younger brother"): S. P. *-tsi-* diminutive suffix (not to be confused with noun-ending *-tsi-*: N. *-tli*); Gabr. *-tši* (as in *mutu-tši* "flea")
 N. *uitzilin* "petit oiseau qui bourdonne," *uitzil-aztatl* "bird-heron," *uitzi-tzi-lin* "oiseau-mouche": S. P. *witsi-ts'* "bird"; Ser. (H.) *witši-t*
 Pap. *šihš* "elbow," *SihSü-wuah* "to hit with the elbow" (< Uto-Aztekian **tsitse-*): S. P. *man-tsílvu-phi*, *man-tsí-l'a'* "bone from elbow to wrist" (*man-* "hand")

Nahuatl *tš*, *ts* corresponds to Shoshonean *š*, *s* in:

N. *toch-tli*, *tochin* "lapin": Luis. *dosi-xi-t* "rabbit"; A. C. *disi-xa-t*; S. J. C. *dòš-t*; Gabr. *tošo-xo-t*; Fern. *toho-x-t* (-*h*- < *s*); Git. *dühò-gu-t* (-*h*- < *s*)
 N. *ach-ili* "frère ainé;" Cora *has* "alterer Bruder": Cahu. *pas* "elder brother"

¹ Dolores, *Papago Verb Stems*, p. 242.

² See Carochi, pp. 476-478.

N. *uetzi* "to fall"; Tepecano *giš*, preterit *gii* (*giš* < **witsi*) "to fall into the water";¹ S. P. *wii-i-* "to fall" (< **wisi-*)

Tepecano *šia-* (< Uto-Aztekian **tšia-*) in *tá-šia* "morning," *a-šia-t-* "to dawn," *ši-ā-r* "east"¹; S. P. *-šia-* in *ta-šia-* "to dawn" (for *ta-* see N. *tla-* under Uto-Aztekian *tl*)

Possibly also in:

N. *quech-tli* "neck": Cahu. *qus-pi* "throat" (see N. *quech-tli* under Uto-Aztekian *t*)

Uto-Aztekian k

Uto-Aztekian *k* regularly appears as Nahuatl *k* (written *c* or *qu*) and as Shoshonean *k*. In Southern Paiute this *k* is always more velar (*q*) than mid-palatal before all vowels but *i*, in which case it appears as *k*; after *i* it is regularly palatalized to *kv*. Examples of initial Uto-Aztekian *k* are:

N. *quech-tli* "neck": S. P. *qura-* "neck" (but see N. *quech-tli* under Uto-Aztekian *t*)

N. *que-* verbal prefix referring to "teeth" (e. g. *que-tzoma* "mordre," cf. *tzoma* "coudre, couvrir une chose de paille"): S. P. *qi-* instrumental prefix "with the teeth." Related to this is perhaps

Pap. *küi* "to bite, sting"; Cora *kì* "fressen (von fester Nahrung)": S. P.: *qi'i-* "to bite"

N. *ca*, *cat-qui* "to be in a place"; Cora *ka* "sein, sich befinden, sitzen" (sing.): S. P. *qarí-* "to dwell, sit" (sing.); Hopi *gatō* "to sit"

N. *cal-li* "house"; Tar. *kali-*: S. P. *gan-i-* "house"

N. *-camo* "not"; Cora *ka* "nicht, nein": S. P. *qa-*, *qatšu-* "not"

N. *can-tli* "cheek"; Pap. *kam*: Tüb. *gana-* "beard"

N. *cochi* "to sleep"; Cora *kutsu* "schlafen, einschlafen," *kutsi-fe* "einen einschläfern"; Pap. *koi* "to sleep (sing.), die (plur.)"; Tepecano *koš*, preterit *koi*: S. P. *gɔ'i-* "to go to sleep (plur.)"

N. *icxi-il* "foot" (with prosthetic *i*, cf. *no-xxi* "my foot"; < **kesi-*, *kasi-* ?); Tepecano *kāi* "foot"¹ (< **kahi* < **kasi*): Mono (In.) *-gügüi* "foot" (reduplicated); Hopi *göögö*

N. *col-li* "aieul, aieule": S. P. *qun'u* "great-grandfather"; Ute *qön'u-* "paternal grandfather"

Cora *kin* "der Gatte"; Pap. *kuN* "husband": S. P. *qum'a-* "husband, male"

Cora *kipi* "Hals" (< **kupi*; Diguet gives *koujpi* "cou"); Huich. *kouipi*: Cahu. *quspi* "throat." See also Pap. *kuhŠiwoh* and Tepecano *kucuá* under Uto-Aztekian *t* (N. *quech-tli*)

¹ Quoted on Dr Mason's authority.

Huich. *ki* "house"; Cora *tši* "Hütte" (< **ki*; Uto-Aztekian *ki*- regularly gives Cora *tši*-, while Cora *ki*- goes back to Uto-Aztekian *ko*-); Pima *ki*: Hopi *ki-hö* "house"; Cahu. *ki-š*

After vowels, Uto-Aztekian *k* appears in Southern Paiute as geminated *q'*, spirantized *γ*, or nasalized *ηq*. Examples of N. *-k*- corresponding to all three of these forms are:

- N. *-qui* (present imperative), *-quiuh* (future indicative), *-co* (present and perfect indicative) "to come to do so and so": S. P. *-k'i-*, *-γi-*, *-ηki-* "to come to do so and so"
- N. *-que-il(t)* (older form), *-c* "having"; Cora- *ke* (e. g. *péri-ke* "ein Kind haben"); Pap. *-kah* "to have or claim": S. P. *-q'ai-*, *-γai-*, *-ηgai-* "to have"
- N. *-c* adjectival suffix (e. g. *izta-c* "white" from *izta-tl* "salt"): S. P. *-q'a-*, *-γa-*, *-ηqa-* adjectival suffix; Cahu. *-xa-* (spirantized form of suffix: *seta-xa-t* "salty")
- N. *-ca* "avec, par, à l'aide de, au moyen" (this suffix often makes gerunds or adverbs out of verb stems: *icuih-cā* "quickly" from *icui* "to go quickly, hurry," e. g. *icuihccā n-iauh* "while-hurrying I-go"): S. P. *-q'ai-*, *-γai-*, *-ηgai-* "as, when" (verbal suffix making subordinate clause whose subject is identical with that of main clause; followed by *possessive* pronominal suffixes)
- N. *-co*, *-c* "in, from": S. P. *-q'o-*, *-γo-*, *-ηqo-* "as, when" (verbal suffix making subordinate clause whose subject is different from that of main clause; followed by *possessive* pronominal suffixes)
- N. *-quia* suffix used in apodosis of conditional sentence: S. P. *-q'ō-*, *-γō-*, *-ηqō-* irrealis

Examples of geminated *-q'*- in Southern Paiute are:

- N. *paca* "laver une chose"; Tep. *baku-ane*: S. P. *na-vaq'i-* "to bathe" (intransitive)
- N. *noquia* "verser," *noqui-ui* "couler, se répandre (en parlant d'un liquide)": S. P. *n^uqwí-n^ut* = *nug'wi-* "stream" (-*qw-* < -*q* because of preceding *u*)
- N. *miqui* "to die"; Huich. *mouki* "mort"; Cora *muitši* "tot" (< **muiki*); Pima *muha* "to die," *moki* "dead"; Pap. *muh* "to die" (< **muka*, cf. Pima *muha*): Hopi *moki* "dead"; Cahu. *muki-š* "dead," *meka* "to kill"; S. P. *tša-ηwuk'i-* "to die off" (< *-*mik'i*-)
- N. *-que* plural suffix in perfect and future, also for certain nouns (e. g. *ueuetquē* "old men," regularly of possessive nouns in *-θ*, *-uθ*), *-can* plural suffix in imperative and present optative: S. P. *-q'a-* verbal suffix indicating plurality of subject
- N. *-c*, *qui*- "him, her, it": S. P. *-a-q'a-* "it (visible)," *-'...q'wa-* (invisible)" (these pronominal suffixes are compounded of *-q'a-* "it," which does not appear as such, and demonstrative stems *a-* "that visible" and *'u-* "that invisible")

N. *-c*, *-qui* (older form) preterit suffix, *-qui* past participle (e. g. *palan-qui* "corrompu") *-ca* pluperfect suffix (preterit suffix of certain irregular verbs, e. g. *cat-* "to be somewhere"); Huich. *-kai* preterit suffix (e. g. *moumouk'i-kai*, "il était mort"); S. P. *-q'ai-n'a* makes perfective verbal nouns, *-q'a-nti-* makes perfective participles

Cora *tika-ntše* "in der Tiefe": S. P. *t'w'qwa-* = *tug'a-* "to be deep"

Pap. *va'kū* "hole": S. P. *⁊-páq'⁊* "hole"

Pap. *noh* "to bend" (< **nɔkɔ-*): S. P. *n⁊qom'i-* "to bend" = *nɔq'ɔ-*

Pap. *tšüh* "to taste" (< **tüka-*): S. P. *t⁊q'a-* = *tüq'a-* "to eat"

Other examples than S. P. of Shoshonean postvocalic *k* are:

Huich. *houca* (i. e. *huka*) "jambes"; Cora *houca* (quoted from Diguet; Preuss gives *ika* "der Fuss, das Bein, der Knochen"); Cah. *huoki*: Hopi *hokya* "leg"; Mono (N. F.) *-huk*

N. *miec* "much": Luis. *muyuk* "much." This *-k* is suffixed, as shown by Cora *mui*; Pima *moi* "many"

N. *èca-il* "vent, air"; Cora *äka(ri)* "Wind"; Huich. *heheaca* "air" (reduplicated); Tüb. *üxka-wa-l* "wind"; Mono (N. F.) *hig-wa-p*; Gabr. *ahika-ŋ*

Examples of S. P. spirantized *γ* are:

N. *yecoa* "avoir des raports charnels avec quelqu'un"; S. P. *yɔγɔ-* "to copulate"

N. *yaca-il* "nez, pointe"; Cah. *yeka* "nose": Hopi *yaka* "nose"; S. P. *yayā-* "end"

N. *toquia* "attiser le feu": S. P. *tuywa-* "to put out the fire" (-*w*- due to *u* preceding *γ*)

N. *tequi* "couper," *ui-tequi* "égrener en frappant": S. P. *t̄ȳa-n'ni-* "to butcher (meat)," *t̄ȳa-* "to gather seeds by beating with seed-beater"

N. *-ca* frequentative intransitive suffix of verbs expressing sounds and other activities (e. g. *calā-ni* "hacer ruido cosas como nueces, el cacao quando le cuentan": *cacala-ca* "se usa quando estas cosas son muchas"; *pallā-ni* "volar": *papatla-ca* "reboletear el ave, temblar el corazon"): S. P. *-ya-*, *-xa-* frequentative intransitive suffix, particularly of verbs expressing sounds (e. g. *q̄i-k'i-n'ia-* "to sound like one tear of a rag": *q̄i-xa-n'ia-* "to sound like a rag tearing;" *⁊-pug'wi-* = *up'ug'wi-* "to bounce": *ovoq'wa-ya-* "to bounce up and down like a rubber bali")

Huich. *gueatzou* "poisson" (i. e. *keá-tsú*): S. P. *pā-γiu-* "fish" (lit. "water-fish"); Cahu. *kiyu-l* "fish"

N. *poc-tli* "smoke, vapor, fog, mist": S. P. *paxi-n'a-* "fog"; Cahu. *paxi-š* "fog"; Fern. *paki-t* "cloud"

N. *oco-il* "pinus tenuifolia"; Cora *hukú* "Kiefer": S. P. *oγ̄b-mp'U* "fir"

¹ See Carochi, pp. 476-478.

N. *maca* "to give"; Cah. *maka*; Pap. *mah* (< **maka*): S. P. *maya-* "to give;" Fern. *maxa*; Cahu. *maxa*; Git. *a-mak*
 N. *çequi-il* "boue, fange": S. P. *soyo-* "moist ground"
 N. *coa-tl* "serpent"; Huich. *kou* (i. e. *ku*): S. P. *-yoa-* in *to-γōa-phi* "rattle-snake"
 N. *aqui* "qui?" *acé* "quelqu'un": Cahu. *haxi* "who?" Fern. *haki* "who?"
 Hopi *hak'i* "who": S. P. *aγa-* "where? how? what?"
 N. *acatl* "roseau"; Cora *haká* "das Schilfrohr": S. P. *paγa-* "reed"
 Cora *tíka* "Nacht sein"; Pima *tšvka-ŋgi* "night": S. P. *tuγwa-* "to be dark,
 night" (-*w*- due to *u* preceding *γ*); Tüb. *duga-l*
 Pap. *vah* "to go in" (< **paka*-): S. P. *paγa(i)-* "to walk"
 N. *-cpac* "sur, au-dessus, en haut": S. P. *-v'āγi-* "over" (< **p'āk'i*)

Several of these examples show that Shoshonean *-k-* is often spirantized to *-x-* in Luiseño-Cahuilla and Gabrielino-Fernandino. Further such examples are:

N. *tláca-tl* "person": Hopi *táqa* "man"; Git. *daga-t* "person"; Fern. *daxa-t*;
 Luis. *-tax*; A. C. *-tax'a*
 N. *çaca-tl* "paille, herbe, junc": Ser. (H.) *haka-t* "willow"; Cahu. *saxa-t*
 N. *aca-na* "mettre à sec, tirer une chose de l'eau," (refl.) "se mettre à sec, en
 parlant d'un navire": A. C. *haxa-l* "sand"; Luis. *ex'-la* "earth";
 Gabr. *öxa-r* "land"; Fern. *öxa-r* "land"

An example of S. P. nasalized *ŋq* corresponding to N. *k* is:

N. *nacaz-ili* "ear"; Huich. *naka*; Cah. *naka*; Pap. *nahkü*: Hopi *nak"-ve* "ear";
 Mono (N. F.) *-nakx*; Luis. *-naq*; Cahu. *-naq'a*; S. P. *naŋqá-va-phi* "ear,"
 naŋqa-q'ai- "to hear." We saw above, however, that S. P. *-ŋq-* may
 here go back to reduplicated **nanaka-*; cf. Tep. *nanaca* (according to
 Diguet), Pima *nank* (quoted from Kroeber; Russell gives *nahaka*), Fern.
 -nanak. We are doubtless dealing with Shoshonean *-ŋk-* also in Shik.
 -naŋi "ear" (misheard for *-naŋgi* ?); Tüb. *naŋha-* (< **naŋxa-* < **naŋka-*;
 cf. Tüb. *aŋhanī-l* "person" < **aŋxanī-* < **aŋkanī-* < **a-nakanī-*:
 A. C. *naγani-š* "man" < **nakani-*)

N. *k* seems to correspond to S. P. *kw* in:

N. *quetl* (poetic form) "to arise," *quetza* (ordinary form): S. P. *qwiri-* "to get up"

GEOLOGICAL SURVEY OF CANADA

OTTAWA, ONTARIO

(Part II to be Concluded)